

**Department of Botany
School of Chemical & Life Sciences
Jamia Hamdard, New Delhi-110062**

**M.Sc. BOTANY
I SEMESTER EXAMINATION DECEMBER 2023**

Paper Name: **Cell and Molecular Biology**

Paper Code: **MBO-CC102**

Time: **2 ½ hours**

Maximum Marks: **60**

Note: This paper has 3 sections A, B, and C.

Section A: Answer **all the questions**.

Section B: Attempt any **04 out of 06**

Section C: Attempt any **02 out of 04**

Abbreviations used:

CLO-Course Learning Outcomes

CO1: relate the structure with the function of various cell organelles of plant cells (evaluate)

CO2: explain the nuclear, mitochondrial and chloroplast genomes (understand)

CO3: examine mechanisms of cell cycle regulation and cell death processes (analyze)

CO4: describe replication and repair mechanism of DNA, synthesis and processing of RNA and protein, expression and regulation of genes at transcription, translation and post-translational level (understand/evaluate)

BTL-Bloom's Taxonomy Levels

1- Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating

SECTION A

Very Short Type Question (15 questions)

15 x 1 = 15 marks

Q.No.	Question	Marks	CLO	BTL
1	Define the term "cytoskeleton."	1	1	1
2	What are CASPASES?	1	3	1
3	Define polysomes.	1	1	1
4	Where could you find an exception to central dogma in nature?	1	4	2
5	Give one difference between DNA polymerase I and DNA polymerase II.	1	4	4
6	What is RNA editing and where do you find it?	1	1,2	2
7	Enumerate the components of plant cell wall.	1	1,2	4
8	What is excision DNA repair mechanism?	1	1	2
9	Write the genetic code/s for phenylalanine.	1	4	1
10	What is signal sequence?	1	3	1
11	Write down two functions of Aminoacyl-tRNA synthetase.	1	4	1
12	Enumerate the different types of polymerases.	1	3,4	4
13	What is overlapping genetic code?	1	4	2
14	What is secondary active transport in plasma membrane?	1	1,2	2
15	Explain the concept of membrane fluidity.	1	1	2

SECTION B

Short Type Question. (Attempt any **FOUR**)

4 x 5 = 20 marks

Q.No.	Question	Marks	CLO	BTL
1	Discuss the similarities and differences between meiotic and mitotic cell division.	5	1	4
2	What is the importance of DNA replication in cell cycle?	5	4	2
3	Explain the molecular mechanism of RNA splicing and discuss alternative splicing.	5	3	4
4	Discuss the electrical properties of cellular membrane and its importance in transmembrane transport.	5	3	4
5	What is the importance of rRNA? Discuss briefly the genes of rRNA.	5	4	2
6	Discuss the importance of polymorphism in organellar genome.	5	2	1

SECTION C

Long type Question (Attempt any **TWO**)

2 x 12.5 = 25 marks

Q.No.	Question	Marks	CLO	BTL
1	Discuss the regulation of the lac and trp operons in prokaryotic gene expression	12.5	4, 5	2
2	What are cell cycle checkpoints? Discuss the different mechanisms through which the cell cycle progression is regulated.	12.5	3	2
3	Describe the structure and function of ribosomes in protein synthesis.	12.5	2, 4	1
4	Discuss the mechanism and importance of post translational modifications in proteins.	12.5	4	4
